

Conservative Treatment of an Intra-Articular Shear Fracture of the Ulnar Head

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Abstract

Keywords

- conservative treatment
- intra-articular fracture
- shear fracture
- ulnar head fracture

Background Isolated intra-articular fracture of the ulnar head is rare.

Case Description A 59-year-old woman experienced an ulnar head fracture involving the distal radioulnar joint after a fall at ground level. The intra-articular fragment of the ulnar head was rotated into anatomical alignment with an above-elbow cast in 90° of supination for 4 weeks. A below-elbow night splint was retained for 2 additional weeks. Twelve months post-injury, full active motion and bone union were achieved.

Literature Review Only three studies have reported treatment of isolated intra-articular ulnar head fractures, and in all cases open reduction and internal fixation were performed.

Clinical Relevance Our report demonstrated good results for the conservative treatment of an intra-articular ulnar head shear fracture, with early recovery of forearm rotation and wrist function.

Fractures of the distal ulna often accompany fractures of the distal radius. Treatment strategies for ulnar styloid fractures or ulnar neck fractures associated with distal radius fractures have been well studied.^{1,2} However, an intra-articular shear fracture of the ulnar head is rare with only a few case reports documented in the literature; all of which were managed surgically.^{3–5} Here, we report a case of an ulnar head shear fracture involving only the portion that articulates with the sigmoid notch of the radius that was treated conservatively.

Case Report

A 59-year-old right hand dominant woman struck the ulnar side of the left wrist after a fall at ground level. Radiographic examination showed an ulnar head shear fracture in the distal radioulnar joint (DRUJ) accompanied by a Chauffeur's fracture of the distal radius and a triquetrum fracture (►Fig. 1). Subluxation of the ulna and dissociation of the DRUJ was determined by computed tomographic (CT) imaging (►Fig. 2A). Reduction in the ulnar head under fluoroscopic control was acceptable with the forearm in 90° of supination. Fracture

reduction was confirmed by CT examination (►Fig. 2B). The patient was then managed conservatively with an above-elbow cast in 90° of supination for 4 weeks. Active and passive range of motion exercises including rotation were initiated, and a below-elbow night splint was retained for an additional 2 weeks. At 14 weeks post-injury, both active wrist motion and pronation-supination had fully recovered, and the patient could perform all the activities of daily living without any pain. The reported Disabilities of the Arm, Shoulder, and Hand score was 0. The patient-rated wrist evaluation score was 3. Twelve months post-injury, radiographic and CT examination showed bone union with a malunion of the ulnar head and osteoarthritis in the DRUJ (►Fig. 3). However, the patient Disabilities of the Arm, Shoulder and Hand score was 0. The patient-rated wrist evaluation score was 1, and full grip strength and motion were achieved (►Fig. 4).

Discussion

Isolated intra-articular fracture of the ulnar head is relatively rare. Jakab et al³ deduced that a direct blow to the ulnar

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Fig. 1 Radiograph showing a displaced intra-articular fracture of the ulnar head.

aspect of the wrist would create combined shear and compressive loading, which could lead to the observed fracture pattern. Only three studies have reported treatment of

isolated intra-articular ulnar head fractures, and in all cases open reduction and internal fixation (ORIF) was performed.

Jakab et al³ performed ORIF using a cannulated compression screw through a standard dorsal approach, protecting the dorsal ulnar sensory nerve. After the operation, the patient's wrist was immobilized for 10 days, and progressive range of motion exercises were initiated. By 3 months, the patient had regained 90° of both supination and pronation. At the final 2-year follow-up, the patient was found to have regained full grip strength and was using the wrist without any limitations, including no diminution of range of motion. Solan et al⁴ also performed ORIF using a cannulated compression screw through a standard dorsal approach. Postoperatively, the patient was immobilized in an above-elbow cast for 2 weeks. Rotation was then allowed, and a below-elbow cast was retained for 4 additional weeks. The fracture united uneventfully, and full range of rotation was restored. Goikoetxea et al⁵ also performed ORIF using a cannulated compression screw through a standard dorsal approach. After the operation, the wrist was enclosed in a short forearm cast. At 3 weeks, the patient started rehabilitation, consisting of progressive increases in passive and active motion. Fracture union occurred without any complications with restoration of full forearm and wrist motion. At the 18-month follow-up, the patient had no symptoms and continued to play golf.

The ulnar head acts as a keystone maintaining stability at the DRUJ.⁶ Disruption of the keystone's architecture due to malalignment or nonunion of the ulnar head results in long-term DRUJ arthrosis, realignment of the forearm joint axis of rotation, and negatively influences the wrist stability and strength.⁶ Based on this anatomical importance, all of the patients were treated surgically in these three reports. Physiologically, rotational movement gives rise to a translational

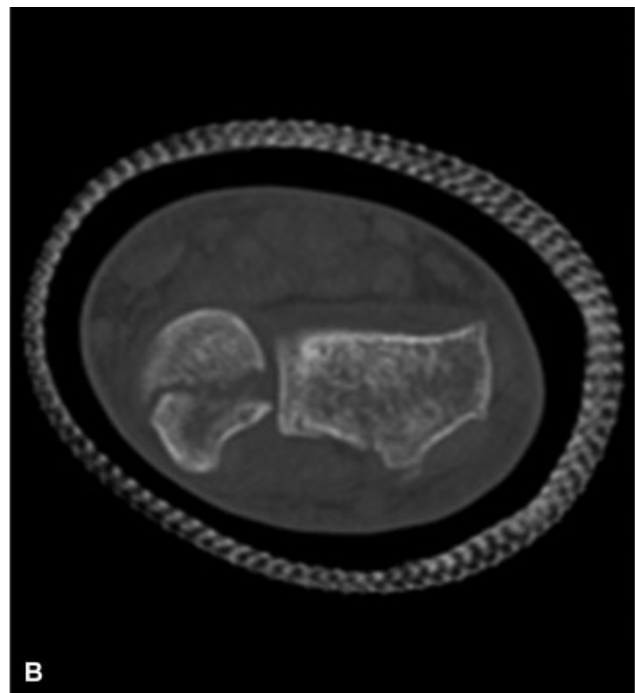
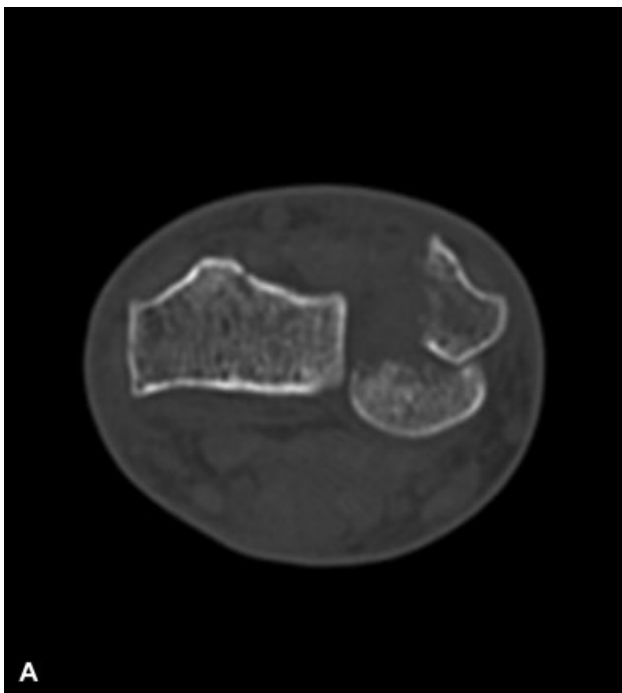


Fig. 2 (A) Axial computed tomography (CT) view of the distal radioulnar joint (DRUJ) in 90° of forearm pronation. The displaced fragment of the ulnar head involves the DRUJ. (B) Axial CT view of the DRUJ in 90° of forearm supination. The displaced ulnar head fragment is reduced.

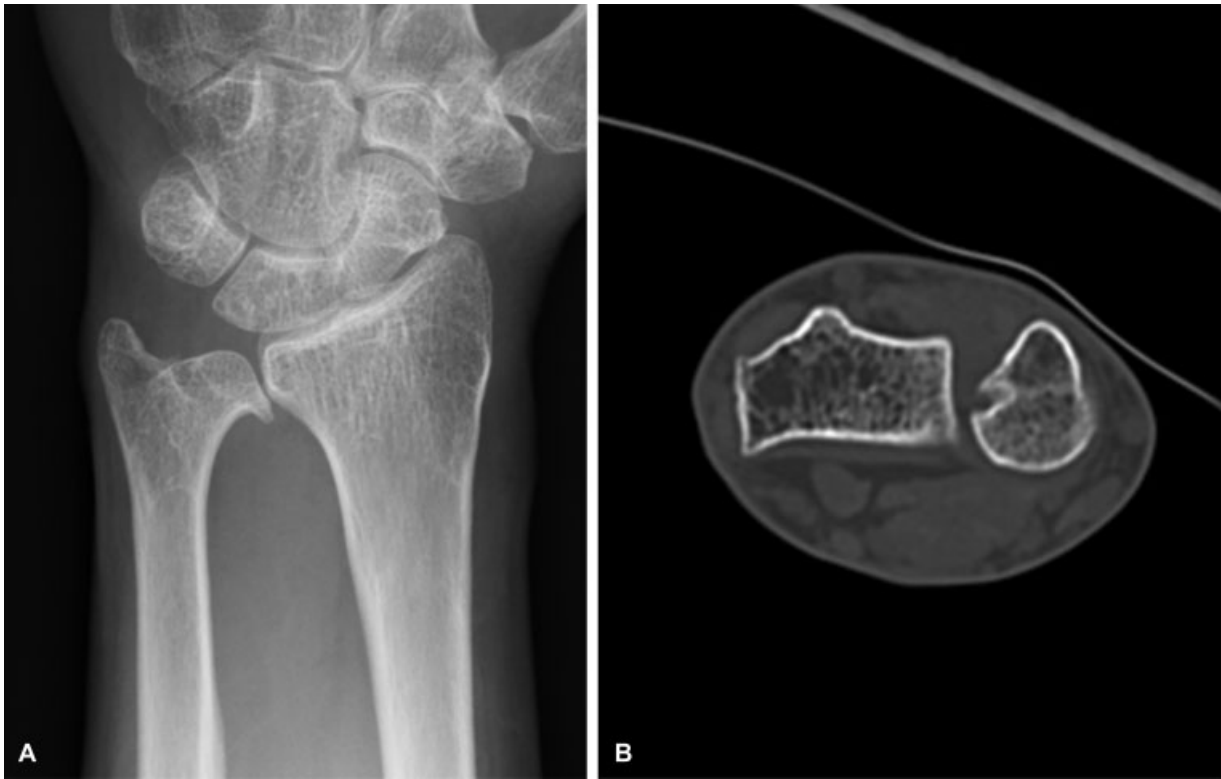


Fig. 3 (A) Radiograph showing bone union of the ulnar head with an osteophyte 1-year post-injury. (B) Axial computed tomography view of the distal radioulnar joint in 90° of pronation. The fracture gap of the ulnar head showed a new bone gap and good articular congruency.

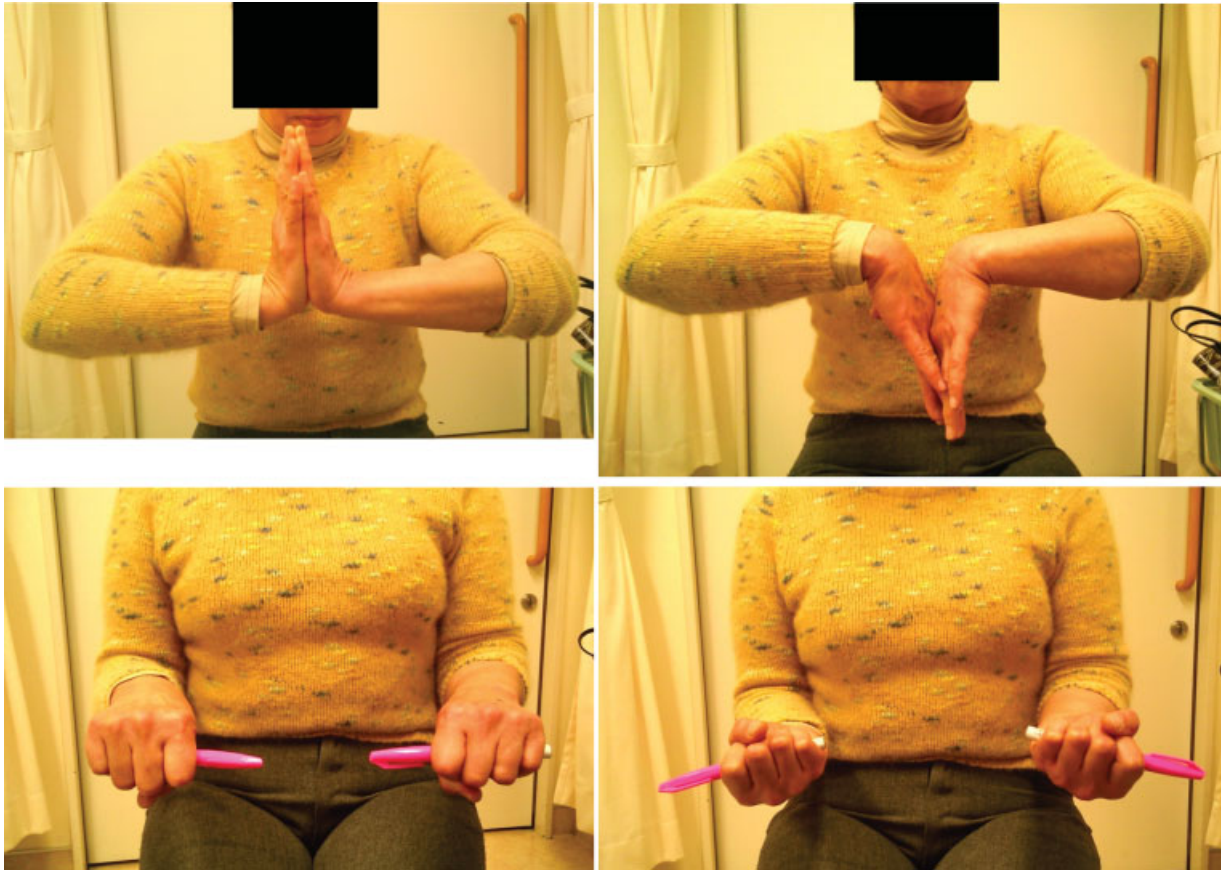


Fig. 4 Active range of motion of the wrist and forearm 1-year post-injury (left side). The patient achieved full pain-free active range of motion.

movement of the radius relative to the distal ulna. In supination and pronation, the ulnar head is positioned toward the palmar and dorsal aspects relative to the radius, respectively.⁷ Therefore for our case, we rotated the intra-articular fragment of the ulnar head into anatomical alignment and reduced the DRUJ congruency with the wrist in a supinated position.

In other studies, reporting operations for distal ulnar fractures with a distal radius fracture (mainly ulnar styloid fractures or ulnar neck fractures), ulnar wrist pain due to hardware irritation, or damage to the superficial branch of the ulnar nerve occurred in 29 to 40% of cases.^{8,9} Usefully, conservative treatment avoids these complications.

We must be careful concerning the long-term effect of osteoarthritis sequelae in the DRUJ because our follow-up period was quite short. Although the number of patients sampled is quite small and a simple comparison is difficult because of different fracture conditions, our report demonstrated good results for the conservative treatment of an intra-articular ulnar head shear fracture, with early recovery of forearm rotation and wrist function.

Conflict of Interest
None declared.

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